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PULSECOM
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Section 1.251
Doc. Issue 2
July 1975

PULSECOM®
DUAL PROGRAMMABLE ATTENUATOR
MODEL 1673-1L1, ISSUE 2
Installation, Calibration, Options and Maintenance
IN#542
Section 1.251
Doc. Issue 2, July 1975

HUBBELL

pulsecom division

HARVEY HUBBELL INCORPORATED

PULSECOM

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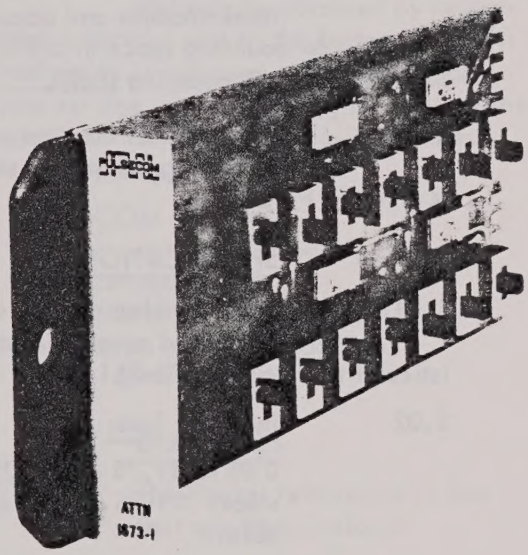

1. INTRODUCTION

1.01 This section provides the description of the PULSECOM® Dual Programmable Attenuator, Model 1673-1L1, Issue 2*. Information for installation, calibration, options and maintenance is included.

2. GENERAL

2.01 The Dual Programmable Attenuator, Model 1673-1L1 was designed to provide level control on four-wire station assemblies or four-wire circuits in the PULSECOM U iversal Equipment Bay. See Figure 1 for typical application.

2.02 The Model 1673-1L1 provides dual channels that may be used to attenuate a four-wire circuit, or dual two-wire circuits, from 0 dB to 31.75 dB in quarter dB steps. The unit uses state-of-the-art techniques in employing thin film precision resistors built into a dual in-line integrated circuit.

2.03 Each channel provides a balanced 600-ohm impedance on both inputs and outputs by using "O" pad configurations. The pad values are selected and programmed on the board by means of miniature switches*.

* Issue 1 units used straps instead of switches; otherwise, Issues 1 and 2 are identical.

The printed circuit board edge contacts and the edge connectors in all PULSECOM mounting shelves are gold plated, thus providing the best electrical connection possible throughout the circuit.

2.04 The inputs and outputs of the unit are symmetrical and therefore either side may be used for input and the other as the output.

2.05 The Attenuator is a type B Mini-Module and occupies a 1-inch wide mounting space in a 3-1/2-inch high PULSECOM mounting shelf.

2.06 A functional diagram of the Dual Programmable Attenuator is given in Figure 2.

3. SPECIFICATIONS

3.01 The following are the electrical and physical characteristics of the Model 1673-1L1.

3.02 Insertion Loss:

0 dB to 31.75 dB in .25 dB steps. ±10% (switch selectable).

3.03 Pad Configuration:

"O" Pad, balanced.

3.04 Impedance:

(a) Input: 600 ohms

(b) Output: 600 ohms

3.05 Size:

3-3/8 inches X 1 inch X 8-1/4 inches (HWD)

3.06 Weight: 5 ounces

3.07 Temperature: 0° to 60° ambient

3.08 Humidity: 0 to 95% Relative (no condensation)

4. OPTIONAL MODES OF OPERATION

4.01 The Dual Programmable Attenuator, Model 1673-1L1, was designed to enable adjustable pad loss values. This is achieved by means of miniature switches placed between the thin film resistors. These switches are used to place the resistors either In (on) or Out (off) of the Attenuator, thus varying the pad loss.

4.02 Each circuit of the Dual Attenuator can be programmed to introduce pad loss ranging from 0 dB to 31.75 dB in quarter dB steps. A typical applications example is given in Figure 1. In this particular application the dual pad module is used to obtain a 0 TLP transmit from a +7 TLP out of the mux, and to bring a -5 TLP down to a -16 TLP going into the mux. Figure 3 provides identification and location of the pad switches.

5. INSTALLATION

5.01 Installation of the Model 1673-1L1 includes mounting arrangement considerations, connector wiring or patching of a program panel on a Universal Equipment Bay, and selection of switch positions. The module should not be inserted into the mounting shelf until the switch positions have been selected according to circuit requirements.

5.02 Mounting - The Dual Programmable Attenuator is a plug-in module designed for installation in a number of equipment mountings which include:

- Universal Mounting Shelves
- Universal Equipment Bays
- Station Apparatus Cabinets
- Special Purpose Mountings

In all of these mounting arrangements, the module is to be inserted into a pc connector of a mounting shelf. Mounting shelf particulars and mounting arrangements are dis-

cussed in separate documentation supplied with that equipment.

5.03 Pre-Wired Shelf. If the module is to be inserted into a prewired mounting shelf, no pc connector wiring other than that specified in documentation supplied with that equipment is required.

5.04 Connector Wiring. If the module is to be inserted into a mounting shelf which is not pre-wired, make applicable connections to the pc connector as shown in Figure 4.

5.05 Universal Equipment Bay. If the module is to be inserted into a mounting shelf which is part of a Universal Equipment Bay, the pc connector is prewired as shown in Figure 5 and only patch cord programming of the patch panel is required. Figure 5 also indicates functions of each of the required positions which are to be patched. The opposite ends of the program patch cords would go to the tie cable panel to pick up the line facilities, or to adjacent program fields to pick up signals which are internal to the Universal Equipment Bay.

5.06 Slide Switches - Before inserting the module into the mounting shelf, place switches in the appropriate positions as required by the application. See Figure 3.

6. CALIBRATION AND ADJUSTMENTS

6.01 Before the Model 1673-1L1 Dual Programmable Attenuator may be inserted into its mounting shelf, the desired pad-loss values must be selected through the switches.

6.02 The pad is inserted in the circuit with the switch in the ON position and it is removed with the switch in the OFF position.

7. MAINTENANCE

7.01 The Model 1673-1L1 Dual Programmable Attenuator should require no maintenance. If the unit fails, field repair should be limited to exchange of the plug-in module only. Repair of the printed circuit boards in the field is not advised.

7.02 Repair services are available and may be obtained by returning the defective unit to the factory. Return authorization is required. Notify Pulsecom of your service requirements by contacting the Repair Department at the following address prior to shipping the unit.

PULSECOM
Division of Harvey Hubbell, Inc.
5714 Columbia Pike
Falls Church, Virginia 22041
Telephone: (703) 820-0652
Telex: 89-9423

8. DRAWINGS

8.01 The figures referred to in the text are given below.

Figure 1. Typical Application.

Figure 2. Functional Diagram.

Figure 3. Identification and Location of Pad Switches on the PC Board.

Figure 4. PC Connector Pin Assignments.

Figure 5. Universal Bay Wiring and Patching Diagram.

8.02 The engineering drawings which provide support technical information are listed below.

D100996 Assembly PC Board, Model 1673-1L1, Issue 2.

C200843 Schematic, Model 1673-1L1, Issue 2.

These drawings are available on request to the Pulsecom Publications Department.

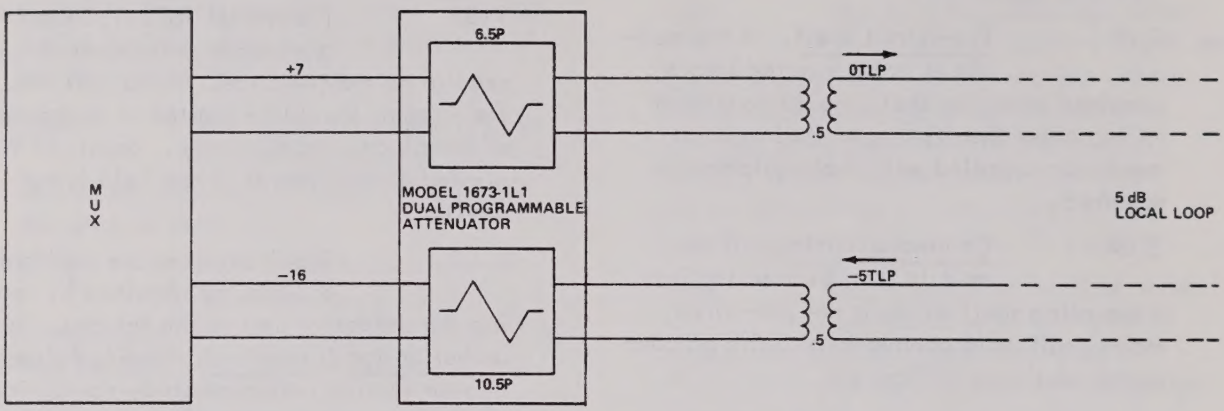

Figure 1. Typical Application, Model 1673-1L1, Issue 2.

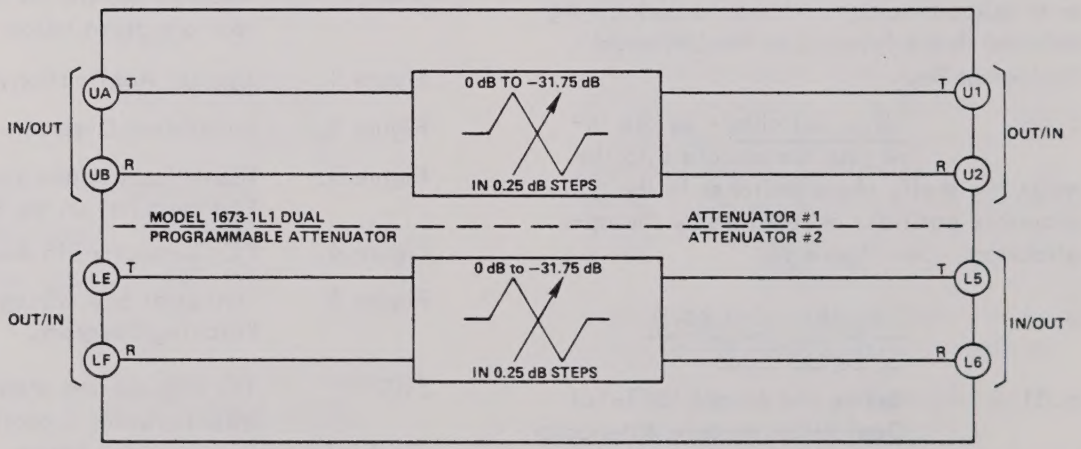

Figure 2. Functional Diagram, Model 1673-1L1, Issue 2.

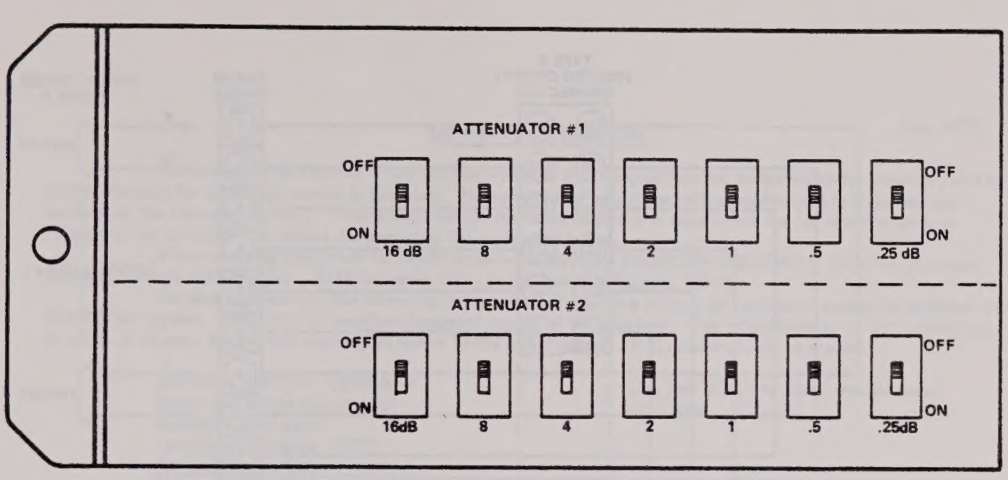

Figure 3. Identification and Location of Pad Switches on the PC Board, Model 1673-1L1, Issue 2.

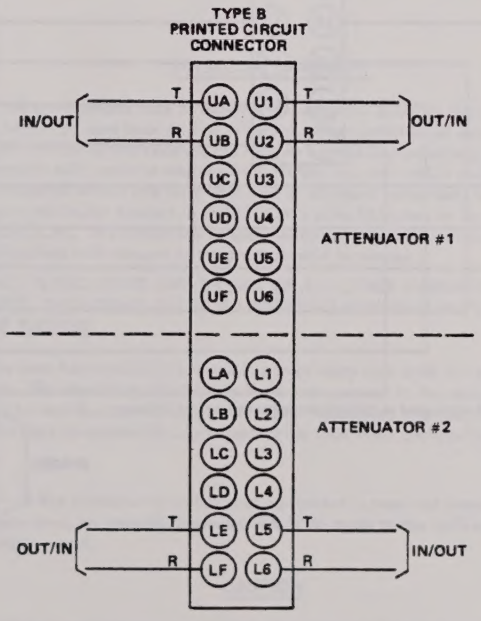

Figure 4. PC Connector Pin Assignments, Model 1673-1L1, Issue 2.

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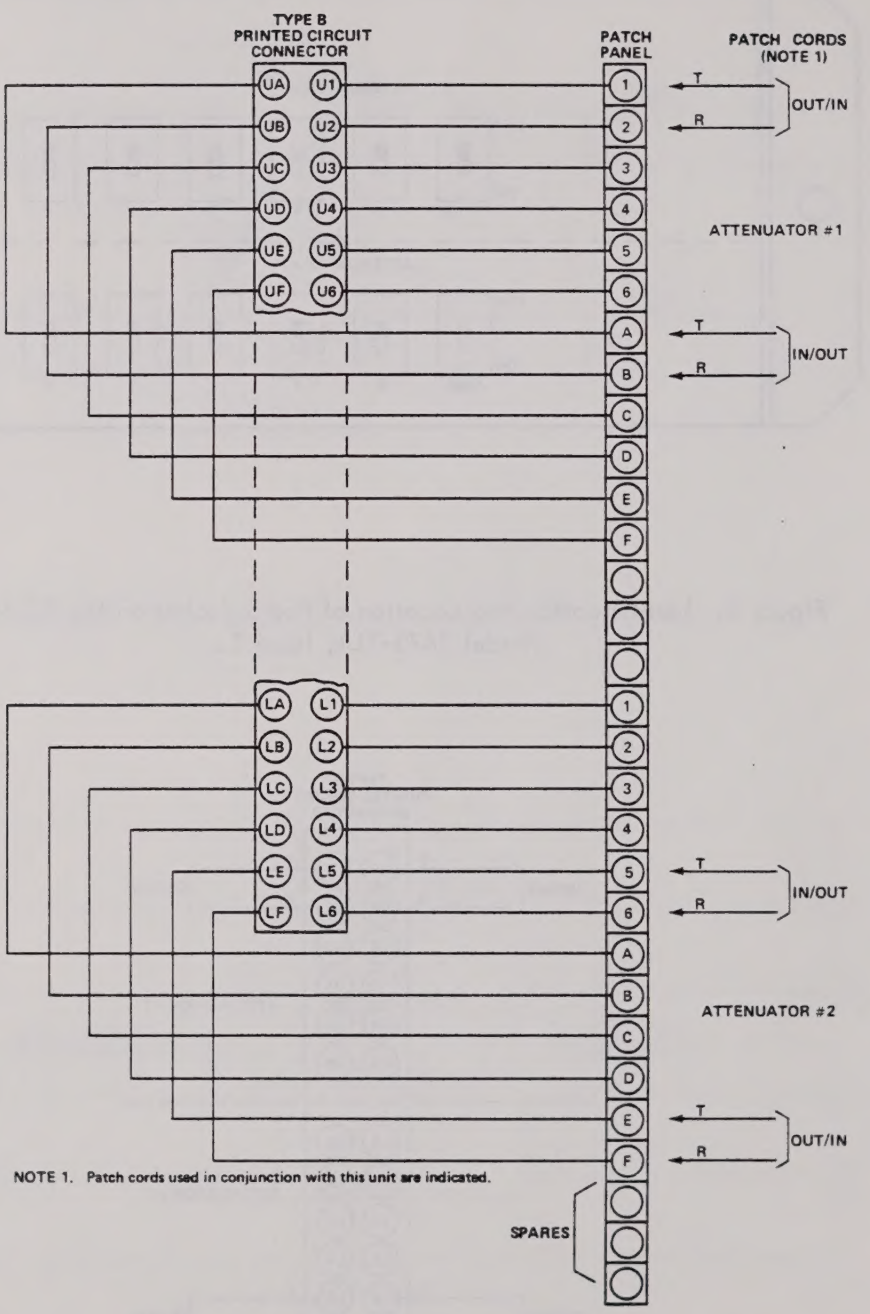


Figure 5. Universal Bay Wiring and Patching Diagram, Model 1673-1L1, Issue 2.

GENERAL INFORMATION

Rev. 8/73

The following information is furnished as an aid in obtaining service for equipment under warranty, and to outline the uses for which the manual is intended. Please note that only those units manufactured by Pulsecom are serviced at the Pulsecom factory. Attachments that are furnished as part of a system, but are not manufactured by Pulsecom, are serviced at locations designated by the equipment maker.

When returning equipment for repair under warranty, ship PULSECOM EQUIPMENT ONLY to Pulsecom Division, Harvey Hubbell, Inc., 5714 Columbia Pike, Falls Church, Virginia, 22041.

For your information, the following list sets forth the service address for equipment commonly furnished with PULSECOM systems. Also, the list mentions important details of the warranty. This information in no way substitutes, in whole or in part, for the full warranty as stated by the manufacturer. It is presented only as a guide.

GENERAL ELECTRIC COMPANY Repair and Return Department Mountain View Road Lynchburg, Virginia 24502 Attn.: Mr. E. Carr	One year parts and labor, except fuses and lamps
R.F.L. INDUSTRIES, INC. Customer Service Department Boonton, New Jersey, 07005 Attn.: Mr. William F. Fettes	One year parts and labor, except fuses and lamps
DURANT DIGITAL INSTRUMENTS A Cutler-Hammer Company Repair Department 901 S. 12th Street Watertown, Wisconsin, 53094	One year parts and labor, except fuses and lamps
TELETYPE CORPORATION 5555 Touhy Avenue Skokie, Illinois, 60076	Everything supplied will be free from defects of workmanship and materials

PULSECOM WARRANTY

The Purchaser has a reasonable time to ascertain whether the products are as represented. Tests made by the Purchaser shall be made within 60 days from date of shipment. The conditions of such tests shall be mutually agreed upon and PULSECOM shall be notified of and reserves the right to be represented at any test. There are no warranties after acceptance but the Company will repair or replace FOB factory any part which under normal and proper use proves defective in workmanship or material within one year from date of shipment hereunder, or within such extended or shortened period specified for a particular product in PULSECOM's sales literature or by special notification in writing by a principal officer of PULSECOM. The correction of such defects by repair or replacement shall constitute fulfillment of all PULSECOM's obligations with respect to the products sold hereunder.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY WHETHER WRITTEN, ORAL, OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

PROPRIETARY RIGHTS -- The data furnished in this manual is proprietary and is for the purpose of engineering reference, maintenance, and instruction. The furnishing of said data in no way conveys to the recipient or the purchaser the right to reproduce the data or to manufacture the equipment herein described. Further, the recipient or purchaser is not authorized to disclose said data to anyone for any reasons other than those outlined above without written consent of PULSECOM.

INCOMING INSPECTION -- If the container in which your equipment is received shows damage, or if upon unpacking the equipment, damage is discovered, an immediate request should be made to the delivering carrier to perform an inspection and to prepare a damage report.

CAUTION

These instructions may contain recommendations for particular wiring within and into equipment from other manufacturers. We have tried to make these recommendations accurate, and where possible, we have tested the instructions with the equipment listed. Since PULSECOM has no control over design improvement changes in the other equipment, it cannot guarantee the applicability of interconnecting instructions and we strongly urge you to confirm compliance between the drawings furnished and the other equipment. Specific installation instructions are available on an individual application basis--contact the PULSECOM marketing group for details.

PULSECOM REPAIR POLICY

REPAIRS UNDER WARRANTY

All Pulsecom products are covered by warranty, limited in strict accordance with the warranty statement on the reverse side. This warranty provides for the repair of equipment which becomes defective because of defective components or poor workmanship.

The warranty does not normally include transportation to our plant. However, items repaired under warranty are returned, prepaid by Pulsecom, to any point within the United States. Warranty repair shipments sent to Pulsecom collect will be returned to the customer collect. Non-warranty repair returns must be pre-paid by customer.

NON-WARRANTY REPAIRS

Normal out-of-warranty repairs shall be charged as follows:

A. Size A (1-1/2" wide) telephone equipment cards	$10.00
B. All other PC cards which sell for less than $200	$25.00
C. PC cards which sell for $200 or more	12-1/2% of replacement cost
D. Assemblies	$15.00 per hour plus parts (1.0 hour min.)

In the case of unusually extensive repairs required for PC cards, charges shall be made on the same basis specified for assemblies.

If a piece of equipment is received and no defect can be found, it will be marked and returned to the customer, and billing will be rendered at the standard rates specified above (whether or not the item is within its warranty period). If the customer still finds something wrong, he should return the unit, explaining the application, installation, and failure mode in as much detail as possible so that we can duplicate the conditions. If we still cannot find the problem, we will contact the customer for consultation.

SERVICE

Equipment is normally returned to the customer within three weeks after receipt at Pulsecom. Emergency repairs may be provided in 72 hours if the customer makes arrangements prior to Pulsecom's receipt of the equipment.

RETURNS FOR REPAIR

Equipment for repair should be returned to the Pulsecom Repair Department and identified with a tag indicating the problem. Special instructions, i.e., desired modification, should be noted on the packing slip.

NOTE

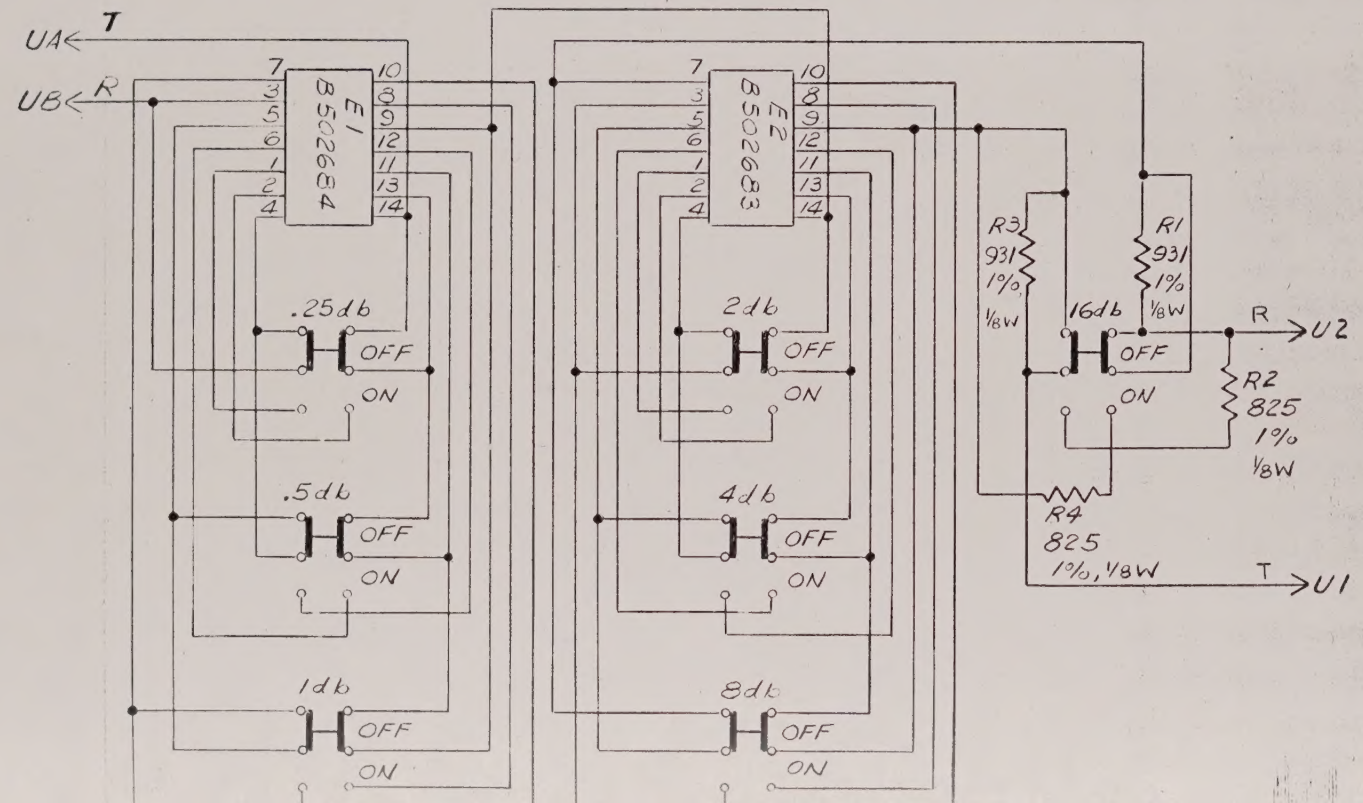
Items modified by customers for special features will be returned to the standard Pulsecom configuration with time billed accordingly unless detailed modification instructions and/or documentation are provided.

PACKAGING

Any equipment returned should be packaged to insure safe arrival at Pulsecom.

RETURNS FOR CREDIT

Material to be returned for credit must have prior Pulsecom approval and be so identified to allow proper credit to be given. If replacement or loan equipment is furnished, it will be accompanied by a "Return for Credit" tag (P.C. Form #166) which will be attached to the equipment when it is returned.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REVISIONS					
NO/SYM	DESCRIPTION	DATE	BY	CHK	APPD
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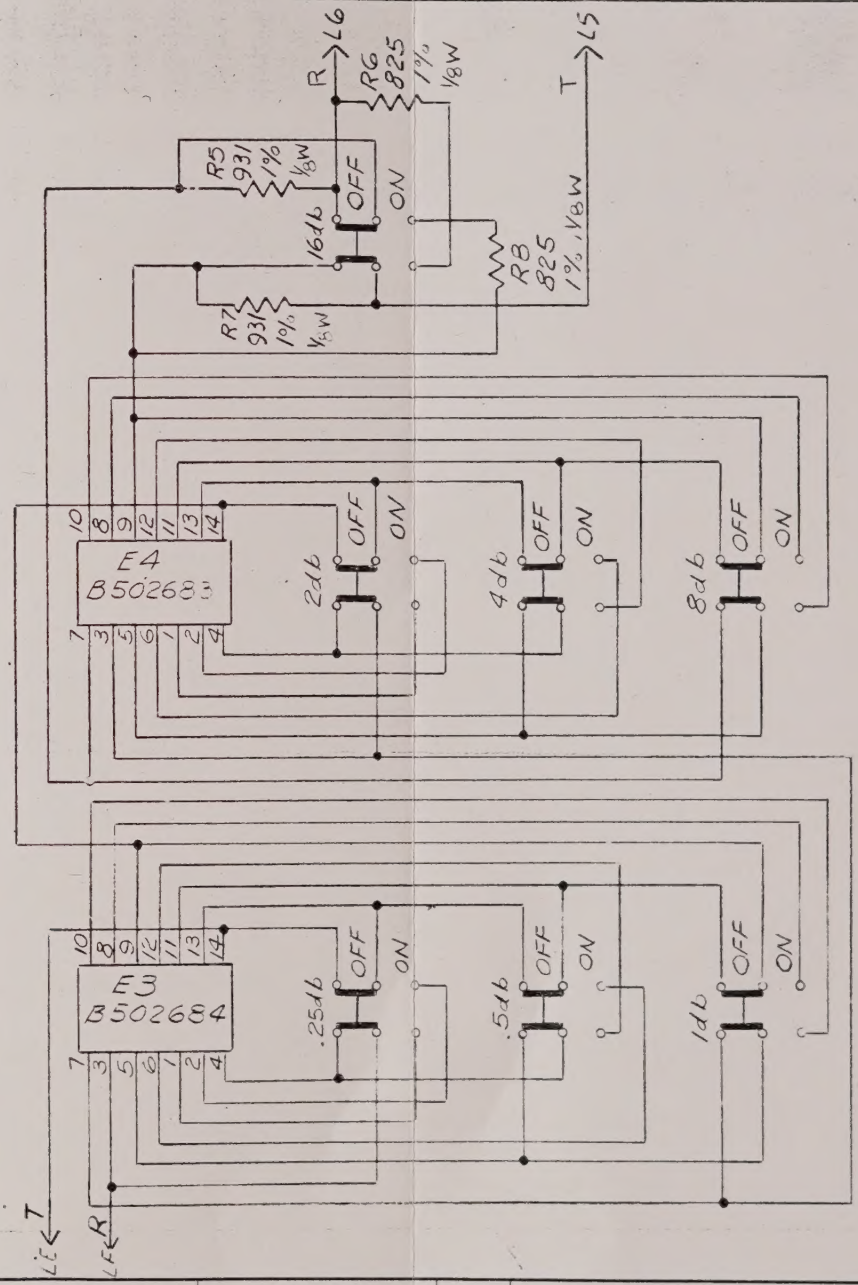
B	REV PER ACO 4274	6-2-72	SHAW	[illegible]	W.G



QTY REQD −1	CODE IDENT NUMBER	PART OR IDENT NUMBER	ITEM	NOMENCLATURE OR DESCRIPTION	NOTES & REF DESIGNATIONS
LIST OF MATERIAL					

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CLEARANCE 20DEC 11		PULSECOM PULSE COMMUNICATIONS, INC. ALEXANDRIA, VA.
TOLERANCES:	DRAWN [illegible]	DATE 2/14/72	
2 PLACE DECIMALS ±	CHECKED [illegible]	DATE 2/14/72	SCHEMATIC DUAL PROGRAMMABLE ATTN. (1673-1L1, ISSUE 2) SEP 30 1972
3 PLACE DECIMALS ±	PROJ ENGRG	DATE	
ANGLES ±	PROD ENGRG	DATE	
DO NOT SCALE DRAWING			
MATERIAL:	CAUTION: UNLESS THIS DRAWING BEARS THE NAMES OF THE "PROJ ENGRG." "PROD ENGRG" IT IS PRELIMINARY AND UNDER NO CIRCUMSTANCES IS IT TO BE USED FOR MANUFACTURING PURPOSES.		CODE IDENT NO. 22818 / SIZE C / DRAWING NUMBER C C200843
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